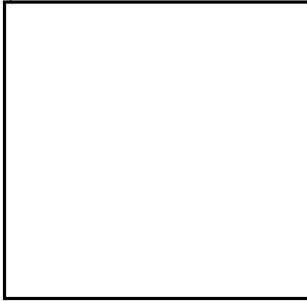


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*April 64*

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PROPOSAL FOR EXTENSION OF  
RESEARCH ON PHOTOINTERPRETER PERFORMANCE

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PROPOSAL FOR EXTENSION OF  
RESEARCH ON PHOTOINTERPRETER PERFORMANCE

Submitted by

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April 6, 1964

PROPOSAL FOR EXTENSION OF  
RESEARCH ON PHOTOINTERPRETER PERFORMANCE

Following are three alternative proposals for the extension of current research on the relation between PI performance and selected photographic parameters. It is proposed that the work be conducted jointly by NPIC, [REDACTED] and this organization. Included with the alternative proposals are separate estimates of time and costs.

ALTERNATIVE PROPOSAL #1

The objective of the study will be to determine the relation between PI performance and the ground resolution of photography.

The results of the study will aid in assessing the relative worth of various collection systems yielding differential ground resolution. Furthermore, the data resulting from the first study will serve as a benchmark with which the effects of such factors as stereo, mixed stereo, color, atmospheric haze, spread function shape, and granularity may be measured in subsequent studies.

The acquisition of photographic material should be planned to achieve sufficient flexibility to investigate all the aforementioned factors. To limit the photography to that required for Alternative Proposal #1 only, would be a mistake.

ALTERNATIVE PROPOSAL #2

The objectives of this work are as follows:

1. To determine the relation between PI performance and ground resolution (the aforementioned benchmark).
2. To assess the effects on PI performance of stereo image viewing as opposed to monocular

viewing.

3. To assess the effects on PI performance of viewing mixed-resolution stereo pairs.

The results of this study will permit a quantitative assessment of mono versus stereo systems, as well as a comparison of two types of stereo. Likewise, the results will indicate which type of photography is best for any of the specific target-types studied.

#### ALTERNATIVE PROPOSAL #3

This alternative is the same as #2 with the exception that the effects of color photography on PI performance will be investigated. It would include <sup>11</sup> investigations of PI performance with monocular color images, of stereo images in which both images are in color and in which one image is in color and the other is in black and white. Variations in ground resolution will be introduced for both the monocular and stereo images.<sup>11</sup>

The results of the work proposed in this alternative would be useful in the ways described in Alternatives #1 and #2. In addition, they would permit the user to make decisions regarding the utility of obtaining color photography at specified resolutions.

It is felt that the sponsor should anticipate the necessity for conducting all of the studies described even though the sponsor may initially wish to conduct only a portion of them.

It is anticipated that the sponsor will be responsible for providing the aircraft, cameras, and original film-processing necessary for collecting the photography. In the event ground targets are required, the sponsor will make the necessary arrangements.<sup>11</sup> At the same time, the contractors will be responsible for the manner in which the photography is performed; the contractors will, in other words, prepare the flight plan and accompany the air-crew during all of the photographic missions.

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The work will be conducted jointly by [redacted]

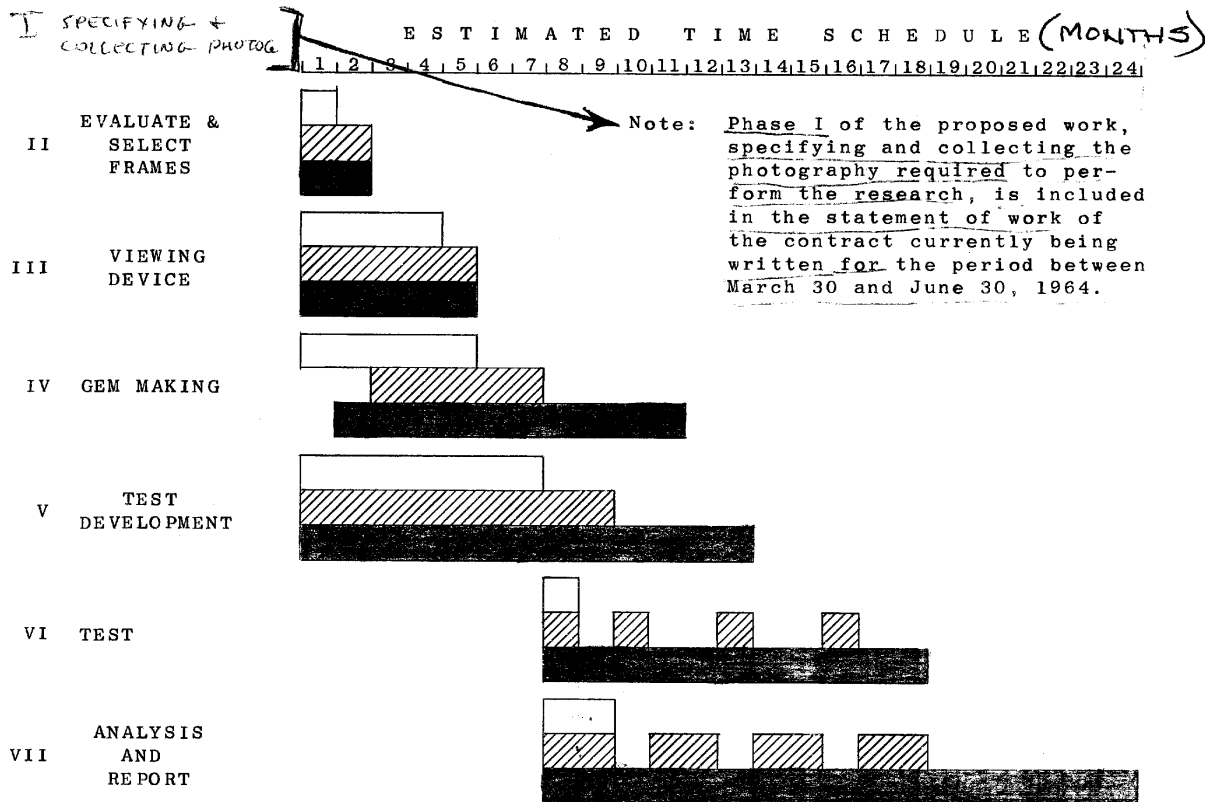
[redacted] will


serve as principal investigator representing [redacted]


[redacted] will serve as principal investigator re-  
presenting [redacted] It is assumed


that [redacted] will serve on the project as a research  
associate. Ultimate responsibility for the research will rest with

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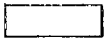


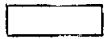



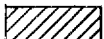

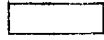

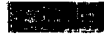
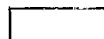



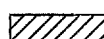

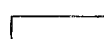
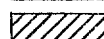






Alternative Proposal #1  Studies of Ground Resolution & PI Performance

Alternative Proposal #2  Studies of Ground Resolution, Stereo, & PI Performance

Alternative Proposal #3  Studies of Ground Resolution, Stereo, Color, & PI Performance

ESTIMATED DIRECT LABOR  
(Man-Months)

<u>PHASE</u>		<u>Senior Research Psychologists</u>	<u>Research Psychologists</u>	<u>Research Assistants</u>	<u>Secretarial</u>
II EVALUATE & SELECT FRAMES		1	1		
		1 1/2	2		
		1 1/2	2		
III VIEWING DEVICE		1/4			
		1/2		Alternative Proposal #1	
		1/2		Alternative Proposal #2	
				Alternative Proposal #3	
IV GEM MAKING		1/4			
		1			
		1			
V TEST DEVELOPMENT		3	3		
		4	5		
		5	6		
VI TEST		1/2	1		
		2	2		
		3	3		
VII ANALYSIS AND REPORT		1	2	2	1
		3	6	8	2
		5	12	16	4
TOTALS		6	7	2	1
		12	15	8	2
		16	23	16	4

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Notes

1. The overhead rate shown in this proposal is a bidding rate. Overhead is allocated to contracts on the basis of a rate derived from actual overhead expenses allowable under cost-type contracts in accordance with ASPR XV and is audited each calendar year by the U.S. Navy Area Audit Office, 929 South Broadway, Los Angeles 15, California.
2. Bidder is not dominant in its field of operation and with affiliates employs fewer than 500 employees.
3. The prices of the items covered do not exceed those paid by any other purchaser from the contractor and the Government is placed in the most favored price category.
4. Prices are based on straight time.
5. Bidder represents that he has not employed or retained a company or person (other than a full-time employee) to solicit or secure this contract and agrees to furnish information thereto as requested by the Contracting Officer.
6. Bidder is incorporated in the state of Nevada.
7. Bidder is a profit institution as determined by the Bureau of Internal Revenue.
8. No subcontracting is contemplated.

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By

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April 6, 1964

DESCRIPTION OF  
PROPOSED IMAGES FOR MENSURATION STUDY

1. IMAGE LAYOUT

It is proposed that the image layout be approximately as shown on the attached sketch. The crosses at the four corners are for monitoring film dimensional changes. These will be sharp images, as will lines  $A_x$  and  $A_y$  and the reference marks which coincide with the x and y coordinates of the points to be measured.

2. IMAGE STRUCTURE CHARACTERISTICS

These images will be made on Kodak Type 3404 (formerly 4404) film and contact printed on Kodak Type 8430 film. The spread function shape of the images will be approximately gaussian.

The layout shown on the attached sheet will be duplicated three times on all pieces of film so that dimension "Z" will be 25, 50 and 100.

Five ground resolutions will be simulated so that the edges of the image shapes will have a density gradient extending over approximately 5, 7.5, 11.2, 16.8 and 24 microns which corresponds to a resolution range of 200 to 40 lines per millimeter.

Each image will be made at five modulation (contrast) levels: .10, .15, .22, .33 and .50.

Thus the matrix of images will be as shown on the attached sheet.

3. PROPOSED PROCEDURE FOR MEASUREMENTS

Hairline is put on sharp line  $A_{y1}$  and measurements are made along the  $A_x$  direction to points B, C, D....J. and to line  $A_{y2}$ .

Page 2

A sample image will be made and measured prior to making all the images for de-bugging both the image-making and mensuration procedures.

Suggestions for changes to the above are invited.

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[Redacted]

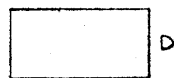
FILM DIMENSIONAL  
STABILITY MARKS

REFERENCE  
MARKS

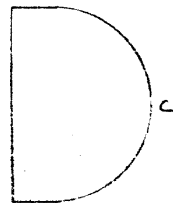
Ay<sub>2</sub>

Ay<sub>1</sub>

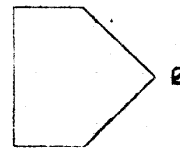
Z



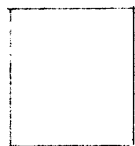
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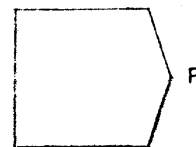
C



B



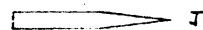
G



F



E



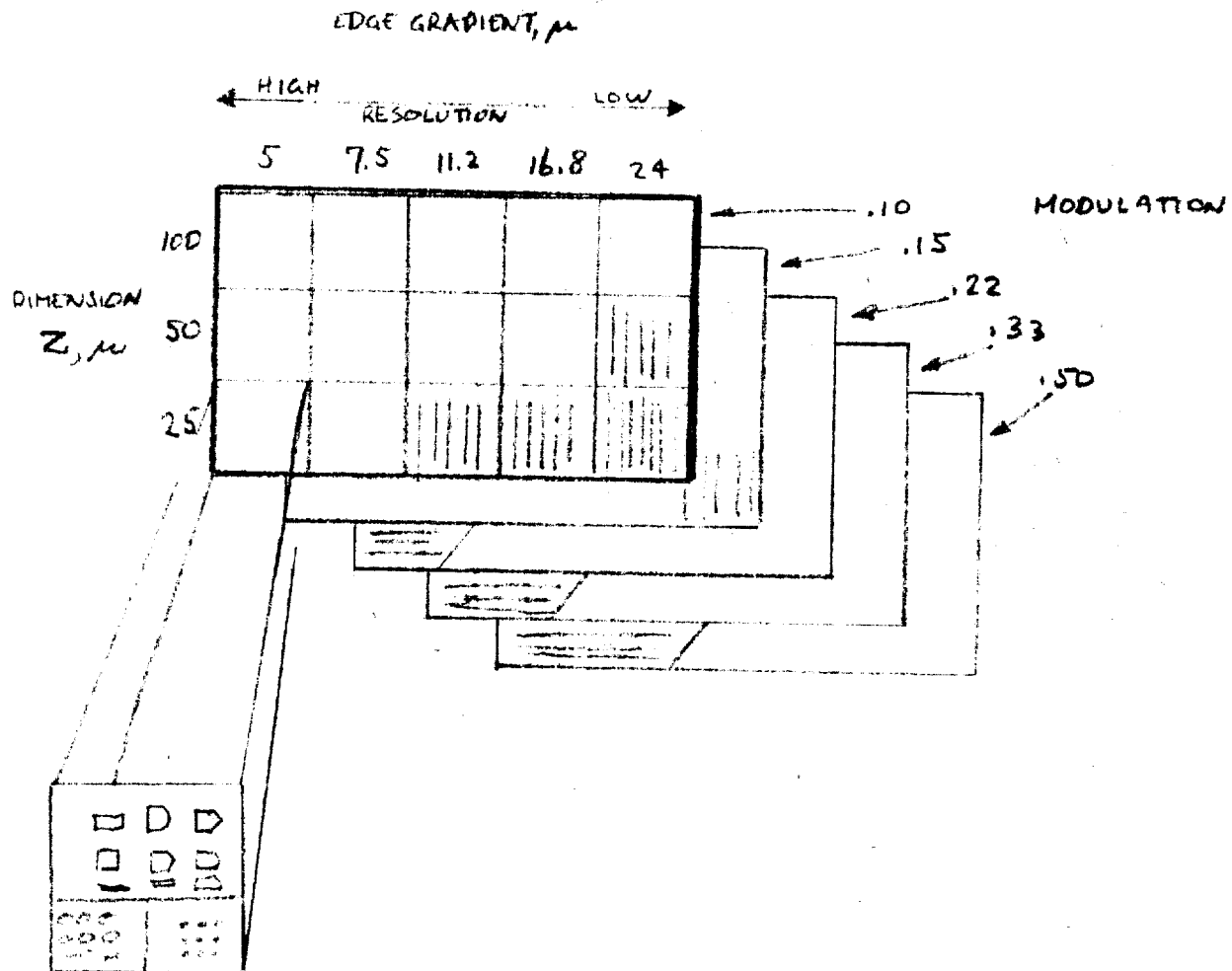
J



I



H



CELLS FOR WHICH MEASUREMENTS MAY NOT BE REQ'D OR MAY BE IMPOSSIBLE

{ 
   
 ||||| MATRIX CELLS PROBABLY BELOW MEASUREMENT THRESHOLD
   
 ===== MATRIX CELLS WELL WITHIN MEASUREMENT THRESHOLD

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